**Anomaly Detection in Credit Card Transactions using Power BI**

* **DAX Functions:**

1. What is the average transaction amount for normal transactions versus fraudulent transactions?

**Ans.** To get the Average of Normal Transaction I have used Average Function to the Amount rows and to Get the Average of Fraudulent Transaction I have used Average Function to the Amount rows with filter as 1 in isFraud row to only find the Fraudulent Transaction.

1. How many fraudulent credits card transactions were recorded in the dataset?

**Ans.** To get the Count of Fraudulent Transaction I have used Count rows Function to the entire data with filter as 1 to isFraud row to find the Fraudulent Transaction only.

1. What is the highest Fraud transaction amount recorded?

**Ans.** To get the Highest Fraudulent Transaction amount I have used MAXX Function to the amount rows with filter as 1 to isFraud row to find the Fraudulent Transaction only.

1. What is the percentage of fraudulent transactions in the dataset?

**Ans.** I had calculated the Total, Average and Count of Normal Transaction & Fraudulent transactions each. Then to find the percentage of Fraudulent Transaction I had to Divide (Count of Fraudulent Transactions) with (Total Transaction) \*100 which gave me the 0.06% of Fraudulent Transaction.

1. Is there a significant difference in the maximum transaction amount for normal transactions compared to fraudulent transactions?

**Ans.** To determine the difference in maximum transaction amounts between normal and fraudulent transactions I had create a measure of Highest Normal Transaction Amount and Highest Fraud Transaction Amount then to find difference by subtracting the maximum amount for normal transactions from the maximum amount for fraudulent transactions.

* **Visualization:**

1. Which merchants have the highest number of transactions? (Top 10)

**Ans.** To get the Top 10 highest transaction merchants we have used Clustered Bar chart where we have used Sum of Amount in x-axis and in y-axis, we have used nameDest

1. Providing a slicer for steps to determine fraudulent activity will offer a better understanding of potential fraud.
2. **Ans.** I have provided a Slicer for Fraud and steps which will change as per your requirement.
3. Create a scatter plot to visualise the relationship between 'oldbalanceOrg' and 'amount' columns.

**Ans.** Scatter plot gives you a glance of Range of amount in which Fraudulent Transaction is done, where in x-axis old balance org is used and in y-axis amount is used with isFraud as legend.

1. Use a line chart to plot the transaction amount over time (step) to identify any unusual spikes or drops in transaction amounts.

**Ans.** The line chart show there is a spike in all the transaction at 7th step and drop in all the truncation at 26th step. Here in y-axis we have used sum of transaction amount and in legend its types are given.

1. Show the sum of amount in each transaction.

**Ans.** The Clustered column chart where we have used Sum of Amount in y-axis and in x-axis we have used for transaction type . Here Cash\_out has the highest transaction & Debit has the lowest transaction.

1. Show the Count as well as % of Normal and Fraudulent Transaction using a donut chart.

**Ans.** The donut chart shows the Normal & Fraudulent Transaction both in count as well as %. Here Average Normal Transaction Amount & Average Fraudulent Transaction Amount is used in the values of Donut chart.

* **Conclusion:**

The Power BI report on anomaly detection in credit card transactions successfully identifies and visualizes key metrics and patterns within the dataset. Through the use of various DAX functions and visualizations, the report provides a detailed analysis of normal versus fraudulent transactions. Key findings include:

* Transaction Averages
* Fraud Detection
* Percentage of Fraud
* Merchant Analysis
* Transaction Types
* Several chats through Visual Insights

This information can be used to enhance fraud detection systems and improve the overall security of credit card transactions.

Overall, this Power BI report not only highlights current issues and trends in credit card transactions but also serves as a robust foundation for ongoing and future efforts in fraud prevention and detection.